

WHAT IS CLAIMED IS:

1. A method of manufacturing a semiconductor device comprising a capacitor including a storage electrode, a dielectric film and a plate electrode, comprising the steps of:

- (a) forming an insulating film;
- (b) forming a plurality of openings in said insulating film that open toward an upper surface of said insulating film;
- (c) forming a film of an electrode material made of metal on a surface of each of said openings and said upper surface of said insulating film;
- (d) etching back said electrode material by performing dry etching thereon, to form a storage electrode made of said electrode material in each of said openings;
- (e) performing wet etching on said storage electrode;
- (f) forming a dielectric film on said storage electrode after said step (e); and
- (g) forming a plate electrode on said dielectric film.

2. A method of manufacturing a semiconductor device comprising a capacitor including a storage electrode, a dielectric film and a plate electrode, comprising the steps of:

- (a) forming an insulating film;
- (b) forming a plurality of openings in said insulating film that open toward an upper surface of said insulating film;
- (c) forming a film of an electrode material made of metal on a surface of each of said openings and said upper surface of said insulating film;
- (d) performing heat treatment in a hydrogen atmosphere on said electrode

material;

(e) etching back said electrode material by performing dry etching thereon, to form a storage electrode made of said electrode material in each of said openings after said step (d);

5 (f) forming a dielectric film on said storage electrode; and

(g) forming a plate electrode on said dielectric film.

3. A method of manufacturing a semiconductor device comprising a capacitor including a storage electrode, a dielectric film and a plate electrode, comprising the steps
10 of:

(a) forming an insulating film;

(b) forming a plurality of openings in said insulating film that open toward an upper surface of said insulating film;

(c) forming a film of an electrode material made of metal on a surface of each
15 of said openings and said upper surface of said insulating film;

(d) polishing said electrode material from above with an abrasive to remove said electrode material lying on said upper surface of said insulating film, thereby forming a storage electrode made of said electrode material in each of said openings;

(e) removing said abrasive that adheres to a structure obtained by performing
20 said step (d);

(f) performing heat treatment in a hydrogen atmosphere on a structure obtained by performing said step (e);

(g) forming a dielectric film on said storage electrode after said step (f); and

(h) forming a plate electrode on said dielectric film.